

**IN THE CLAIMS**

1. (Original) A system for detecting an analyte having a mass, the system comprising:  
a light source;  
a structure having an immobilized portion and a second portion adapted for resonating, wherein said second portion is illuminated by said light source, further wherein said structure has an immobilized binding partner that binds to said analyte on said second portion of the structure, wherein said structure resonates under ambient conditions at a frequency based on the mass of said analyte on said second portion; and  
a photodetector responsive to light reflected by said structure, wherein said photodetector provides an output corresponding to a resonant frequency of said structure.
2. (Original) The system of claim 1 further comprising a processor coupled to said photodetector for determining the mass of said analyte.
3. (Original) The system of claim 1 further comprising a spectrum analyzer coupled to said photodetector for determining a resonant frequency of said structure.
4. (Original) The system of claim 1 where said photodetector comprises a split photodiode.
5. (Original) The system of claim 1 where said photodetector comprises a first photodiode and a second photodiode.
6. (Original) The system of claim 1 wherein said photodetector is adapted for generating a differential voltage signal.
7. (Currently Amended) The system of claim 1 wherein said binding partner is immobilized ~~near~~ at said second end of said structure.

8. (Original) The system of claim 1 wherein said structure comprises silicon, silicon nitride, silicon dioxide, silicon carbide, polysilicon, carbon, diamond-like carbon film, metal or gallium arsenide.
9. (Currently Amended) The system of claim 1 wherein said immobilized portion is rigidly coupled to a support.
10. (Original) The system of claim 1 wherein said structure is adapted for vibrating under ambient conditions including thermal noise.
11. (Original) The system of claim 1 wherein said structure is adapted for vibrating under ambient conditions including ambient air vibrations.
12. (Original) The system of claim 1 wherein said structure is coupled to a piezoelectric drive.
13. (Original) The system of claim 1 further comprising a vacuum environment in which said structure operates.
14. (Original) The system of claim 1 wherein the analyte is a pathogen.
15. (Original) The system of claim 1 wherein the analyte is a microorganism.
16. (Original) The system of claim 1 wherein the analyte is a bacteria, a virus or a subunit thereof.
17. (Original) The system of claim 1 wherein the binding partner for the analyte is an antibody that binds to said analyte.

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18. (Original) The system of claim 1 wherein the binding partner is a cellular receptor that binds to a ligand.
19. (Original) The system of claim 1 wherein the analyte is a ligand specific for a cellular receptor.
20. (Original) The system of claim 1 wherein the analyte is a metallic ion and the binding partner is a chelator that binds said metallic ion.
21. (Currently Amended) The system of claim 1 wherein the binding partner includes a DNA sequence ~~and the analyte includes a complementary DNA sequence.~~
22. (Original) The system of claim 1 wherein said structure comprises a cantilever beam.
23. (Original) The system of claim 22 wherein said cantilever beam vibrates in an out of plane mode.
24. (Original) The system of claim 22 wherein said cantilever beam has a length of 0.5 to 1000  $\mu\text{m}$ .
25. (Original) The system of claim 1 wherein said structure comprises a linear member having a first end, a second end, and a middle region, and wherein said immobilized portion includes said first end and said second end, and wherein said second portion includes said middle region.
26. (Original) The system of claim 1 wherein said structure comprises a disk-shaped member having a perimeter and a center region, and wherein said immobilized portion includes said perimeter, and wherein said second portion includes said center region.
- 27-61. (Withdrawn)
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